

FOCUS AND DIVERSITY IN INFORMATION SYSTEMS RESEARCH: MEETING THE DUAL DEMANDS OF A HEALTHY APPLIED DISCIPLINE

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Appendix A

The Author Set, Co-Citation Counts, and Bibliographies

The starting point of any author co-citation analysis (ACA) is the identification of a set of core knowledge producers within the discipline. Clearly, if patterns of citations of key authors are used to map the development and changes in a field, then the choice of those key authors sets the boundaries and controls the patterns that will be reported. In such a broad and multidisciplinary field as IS, it is important to select authors that are recognized as the key or seminal authors in the field, and to ensure that the author set is fully representational of the breadth of the field over the span of years being investigated. Various ways of selecting authors have been used in the past, including reputation-based surveys of experts or scholars in the field (Bayer et al. 1990; Culnan 1987; Culnan et al. 1990); lists of award winners (Bayer et al. 1990); scholars named in review books or articles with an overview of the development of the field (Ellis et al. 1999); lists of highly cited authors or articles (Culnan 1986; Culnan et al. 1990; Ellis et al. 1999; Lowry et al. 2007; Ponzi 2002; White and McCain. 1998); organizational memberships (Culnan et al. 1990; McCain 1990); publication counts (Chua et al. 2002); and personal judgment (Ponzi 2002).

We used two of these approaches, publication count and reputation, to identify highly influential researchers in the IS field. While the reputational approach captures contributors who have a long tradition of influence in the field, the publication count approach is more effective

in identifying those researchers whose influence is more recent or still emerging. Publication counts identify researchers whose papers have been recognized by leading editors and reviewers of the field as having something new and important to contribute to the IS domain. Thus, we began by selecting the most frequently published authors across five of the six journals in the AIS senior scholars' basket of journals: *MIS Quarterly* (MISQ), *Information Systems Research* (ISR), *Journal of Management Information Systems* (JMIS), *Information Systems Journal* (ISJ) and *European Journal of Information Systems* (EJIS) (see <http://home.aisnet.org/>). (The sixth journal in the AIS scholars' basket is *Journal of the Association for Information Systems*, which we did not include because of its relative youth, being first published in 2000). Authors of all articles published in MISQ from 1984 through 2005, all articles in JMIS, ISR, EJIS, and ISJ from their inceptions in 1984, 1990, 1991, and 1991 respectively, were counted, using the ISI Web of Science databases supplemented by manual counts for those volumes not indexed in the Web of Science databases. We used an arbitrary cut-off point of at least eight publications (excluding editorials) in MISQ, JMIS, and ISR to select the 62 most highly published researchers in these top three IS journals. An examination of contributors to EJIS and ISJ revealed a different constituency of researchers and we added a further nine authors, who each had at least four publications across these two journals.

The reputational approach enabled us to identify early contributors whose major influential publications may have been in non-IS journals, and those who have influenced the field through books rather than through journal publications. Culnan's (1987) list of authors, which she selected as being the most influential early researchers in MIS, was used as a starting point, and we added any authors on this list not already identified through the publication count. We further supplemented the author list from two sources. First, to ensure the inclusion of key foundational authors whose influential works may have been published in books or management-based journals before IS-specific journals were established, we added those researchers who have been recognized by the Association of Information Systems (AIS) for their outstanding contributions to the field. When we developed the author list in 2006, the AIS had conferred 13 LEO awards for "lifetime exceptional achievement in information systems" and 36 AIS Fellow awards, which recognize "individuals who have made outstanding contributions to the Information Systems discipline in terms of research, teaching, and service." The Leo award winners and AIS Fellows not already on the author list were added. Second, in order to expand UK/European representation, we included 10 IS authors identified on a reputational basis in a UK-based comparative study of Information Science and Information Systems research (Ellis et al. 1999).

We used cited reference searches to retrieve sets of citation records, for the years 1986–2005, to each author's works using the ISI Web of Science databases. These records formed the input for the co-citation extraction. We restricted the cited reference search to the Social Sciences database in order to reduce the number of problems arising from retrieving works by authors with the same name writing in different fields.¹ Where we were aware that an author had published with one or two initials (e.g. Orlikowski W and Orlikowski WJ) or that an author's name was frequently misspelled in citations (e.g. Hirschheim is often cited as Hirschheim) we searched using both alternatives. We limited the citing references to articles in English, thus eliminating references in working papers, theses, and other works of limited accessibility to other writers in the field. Finally, we restricted the resulting sets of citing references to a broad set of information systems subject categories both to identify the most influential authors specifically in the IS field and to further reduce the likelihood of contamination from authors with the same name working in other social science fields. Five authors (Ritu Agarwal, Alok Gupta, Michael Jackson, John Ward, and Ron Weber) required intensive manual analysis to distinguish their citations from those to other authors of the same name and initial working in the IS field.

We retrieved a total of 30,059 citations referencing authors in the initial author set, comprising 7,798 unique articles.² The initial author list comprised 117 authors as shown in Table A1, with the author set arranged in descending order of total number of IS-related citations across the twenty year period. Total citations for the 20-year period and for each five-year sub-period (1986–1990, 1991–1995, 1996–2000, 2001–2005) were recorded for each author and are shown in Table A1.

Co-Citation Counts and Bibliographies

The top 100 cited authors, with at least 85 citations each, were selected for the final author list. The next step in ACA is the extraction of co-citation counts to the author set for each time period. A database program was developed to extract co-citation counts for pairs of authors from the citation records retrieved for the final author set, for the four 5-year sub-periods from 1986 through 2005. The co-citation counts were used

¹The *European Journal of Information Systems* (EJIS) is officially listed as being indexed in the Science Citation Index Expanded database and not in the Social Sciences Citation Index database. However, the cited reference searches, limited to the Social Sciences database, included results from EJIS. We were advised by ISI technical support that the cited reference search uses another internal index system, in which EJIS is indexed differently. For our purposes, this different indexing worked to our advantage and enabled the problem reduction described above.

²The number of articles was less than the number of citations because many of these citations referenced more than one of the authors from the list.

Table A1. Initial Author List and Citations*

Authors	Reason for Inclusion	Total citations 1986-2005	1986- 1990	1991- 1995	1996- 2000	2000- 2005
Benbasat I	MISQ, ISR, JMIS publications (39)	751	72	136	242	301
Zmud RW	MISQ, ISR, JMIS publications (29)	732	66	148	235	283
Ives B	MISQ, ISR, JMIS publications (34)	714	96	206	236	176
Keen PGW	Culnan 1987 study	687	131	211	200	145
Jarvenpaa SL	MISQ, ISR, JMIS publications (18)	644	21	106	198	319
Huber GP	Culnan 1987 study	636	83	161	212	180
Markus ML	MISQ, ISR, JMIS publications (11)	614	51	112	215	236
Orlikowski WJ	MISQ, ISR, JMIS publications (9)	589	2	67	227	293
Robey D	MISQ, ISR, JMIS publications (15)	579	74	135	174	196
DeSanctis G	MISQ, ISR, JMIS publications (9)	576	61	156	175	184
Rockart JF	Leo Award	554	96	194	168	96
Grover V	MISQ, ISR, JMIS publications (24)	521	1	44	166	310
Venkatraman N	Ellis et al. 1999 study	490	12	66	189	223
Olson MH	Culnan 1987 study	480	74	120	169	117
King WR	MISQ, ISR, JMIS publications (12)	472	69	103	145	155
Lucas HCJ	AIS Fellow	467	113	114	137	103
Dickson GW	Culnan 1987 study	447	86	140	135	86
Kling R	Leo Award	441	43	72	152	174
Nunamaker JF	MISQ, ISR, JMIS publications (36)	435	18	120	160	137
McFarlan FW	Culnan 1987 study	431	73	117	129	112
Wetherbe JC	MISQ, ISR, JMIS publications (8)	428	45	120	165	98
Ackoff RL	Culnan 1987 study	424	116	120	114	74
Todd PA	MISQ, ISR, JMIS publications (11)	421	9	35	148	229
Igbaria M	MISQ, ISR, JMIS publications (14)	420	3	62	154	201
Checkland P	Ellis et al. 1999 study	395	54	113	114	114
Straub DW	MISQ, ISR, JMIS publications (18)	377	4	55	91	227
Baroudi JJ	MISQ, ISR, JMIS publications (9)	374	33	97	134	110
Lederer AL	MISQ, ISR, JMIS publications (10)	365	11	85	114	155
Davis GB	MISQ, ISR, JMIS publications (11)	362	69	100	101	92
Kraemer KL	MISQ, ISR, JMIS publications (12)	352	33	83	97	139
Dennis AR	MISQ, ISR, JMIS publications (23)	346	10	70	129	137
Hiltz SR	MISQ, ISR, JMIS publications (8)	345	50	90	113	92
Alavi M	MISQ, ISR, JMIS publications (8)	340	30	59	100	151
Konsynski BR	Culnan 1987 study	331	33	109	98	91
Clemons EK	MISQ, ISR, JMIS publications (31)	324	10	73	99	142
Hirschheim R	Ellis et al. 1999 study	319	6	65	121	127
Sprague RH	MISQ, ISR, JMIS publications (9)	311	90	110	77	34
Vessey I	AIS Fellow	307	24	72	114	97
Swanson EB	Culnan 1987 study	302	41	86	88	87
Watson RT	MISQ, ISR, JMIS publications (13)	299	10	41	100	148
Vogel DR	MISQ, ISR, JMIS publications (11)	290	15	88	105	82
Mumford E	Leo Award	287	43	61	108	75
Valacich JS	MISQ, ISR, JMIS publications (8)	280	2	45	128	105

Table A1. Initial Author List and Citations (Continued)

Authors	Reason for Inclusion	Total citations 1986-2005	1986- 1990	1991- 1995	1996- 2000	2000- 2005
Ginzberg MJ	AIS Fellow	279	51	78	79	71
Whinston AB	MISQ, ISR, JMIS publications (17)	269	13	32	88	136
King JL	MISQ, ISR, JMIS publications (25)	268	35	88	80	65
Willcocks LP	ISJ/EJIS publications (9)	268	n/a	16	112	140
Mason RO	Leo Award	267	63	77	75	52
Higgins CA	MISQ, ISR, JMIS publications (9)	265	4	38	88	135
Barki H	MISQ, ISR, JMIS publications (11)	257	4	44	81	128
Churchman CW	Leo Award	257	76	76	56	49
Goodhue DL	MISQ, ISR, JMIS publications (8)	249	1	31	83	134
Walsham G	ISJ/EJIS publications (5)	248	5	26	95	122
Nolan RL	Culnan 1987 study	246	57	71	75	43
Tam KY	MISQ, ISR, JMIS publications (13)	242	1	27	83	131
Bostrom RP	MISQ, ISR, JMIS publications (9)	240	13	60	91	76
Guimaraes T	MISQ, ISR, JMIS publications (9)	236	23	46	97	70
Lyytinen K	AIS Fellow	231	6	37	76	112
Eindor P	AIS Fellow	223	35	56	78	54
Galliers RD	Ellis et al. 1999 study	220	1	35	101	83
Mukhopadhyay T	MISQ, ISR, JMIS publications (14)	217	n/a	10	79	128
Agarwal R	MISQ, ISR, JMIS publications (15)	216	n/a	12	47	157
Lee AS	MISQ, ISR, JMIS publications (20)	203	1	24	92	86
Watson HJ	MISQ, ISR, JMIS publications (11)	196	28	49	63	56
McKenney JL	AIS Fellow	194	35	48	66	45
Mingers J	Ellis et al. 1999 study	190	9	50	57	74
Gorry GA	Culnan 1987 study	188	53	65	47	23
Chen PPS	Culnan 1987 study	184	46	64	39	35
Barua A	MISQ, ISR, JMIS publications (9)	182	n/a	4	71	107
Sambamurthy V	MISQ, ISR, JMIS publications (15)	178	n/a	12	41	125
Leidner DE	MISQ, ISR, JMIS publications (9)	171	n/a	3	31	137
Chin WW	MISQ, ISR, JMIS publications (9)	170	n/a	2	33	135
Boland RJ	Culnan 1987 study	168	16	31	51	70
Lacity MC	ISJ/EJIS publications (4)	168	n/a	16	67	85
Couger JD	Leo Award	166	23	54	54	35
Rivard S	MISQ, ISR, JMIS publications (8)	163	17	46	43	57
Kettinger WJ	MISQ, ISR, JMIS publications (10)	160	1	3	55	101
Kauffman RJ	MISQ, ISR, JMIS publications (20)	153	n/a	14	35	104
Kriebel CH	Culnan 1987 study	152	13	18	56	65
Anthony RN	Culnan 1987 study	150	41	46	35	28
Liang TP	AIS Fellow	147	4	45	46	52
Chervany NL	Culnan 1987 study	144	19	16	18	91
Wiseman CM	Ellis et al. 1999 study	139	21	52	42	24
Saunders CS	MISQ, ISR, JMIS publications (8)	134	5	12	37	80
Mclean ER	AIS Fellow	132	25	34	31	42
Weber R	MISQ, ISR, JMIS publications (17)	127	13	19	34	61

Table A1. Initial Author List and Citations (Continued)

Authors	Reason for Inclusion	Total citations 1986-2005	1986- 1990	1991- 1995	1996- 2000	2000- 2005
Gray P	Leo Award	125	30	29	34	32
Alter S	Culnan 1987 study	121	18	27	32	44
Land FF	Leo Award	119	15	25	51	28
Bjornandersen N	AIS Fellow	118	20	37	32	29
Zwass V	MISQ, ISR, JMIS publications (33)	106	1	3	33	69
Vitale MR	AIS Fellow	105	4	32	36	33
Baskerville RL	ISJ/EJIS publications (8)	103	n/a	5	34	64
Wei KK	MISQ, ISR, JMIS publications (9)	103	n/a	2	36	65
Munro MC	Culnan 1987 study	101	23	36	20	22
Cavaye ALM	ISJ/EJIS publications (4)	99	n/a	0	32	67
Ciborra C	Ellis et al. 1999 study	93	5	9	36	43
Ward J	Ellis et al. 1999 study	88	n/a	8	30	50
Jenkins AM	Culnan 1987 study	86	12	25	34	15
Galletta DF	AIS Fellow	85	2	25	40	18
<i>Smithson S</i>	ISJ/EJIS publications (6)	72	n/a	4	31	37
<i>O'Keefe, RM</i>	ISJ/EJIS publications (4)	68	2	15	21	30
<i>Jackson MA</i>	Ellis et al. 1999 study	66	16	21	19	10
<i>Neumann S</i>	AIS Fellow	63	6	12	30	15
<i>Karimi J</i>	MISQ, ISR, JMIS publications (8)	62	3	20	13	26
<i>Mathiassen L</i>	ISJ/EJIS publications (4)	59	4	5	19	31
<i>Briggs RO</i>	MISQ, ISR, JMIS publications (17)	45	n/a	3	9	33
<i>Kozar KA</i>	MISQ, ISR, JMIS publications (8)	39	4	6	16	13
<i>Avergou C</i>	AIS Fellow	37	n/a	4	8	25
<i>Gupta A</i>	MISQ, ISR, JMIS publications (8)	34	n/a	0	6	28
<i>Carlson ED</i>	Culnan 1987 study	28	13	9	5	1
<i>Mookerjee VS</i>	MISQ, ISR, JMIS publications (8)	25	n/a	2	6	17
<i>Weber BW</i>	MISQ, ISR, JMIS publications (14)	24	n/a	1	7	16
<i>Langefors B</i>	Leo Award	20	8	4	6	2
<i>De Vreede GJ</i>	MISQ, ISR, JMIS publications (9)	18	n/a	0	8	10
<i>Stowell, F</i>	ISJ/EJIS publications (5)	17	n/a	0	10	7
<i>Choudhary V</i>	MISQ, ISR, JMIS publications (8)	14	n/a	0	2	12
TOTAL CITATIONS		30,059	2,927	6,323	9,680	11,129

*We selected authors sequentially, using the following five criteria in order: (1) at least eight publications across MISQ, ISR, and JMIS; (2) at least four publications in ISJ and EJIS; (3) included in Culnan's (1987) study; (4) LEO award or AIS Fellow; (5) included in Ellis et al.'s (1999) study. While some authors met multiple criteria for inclusion, the reason for inclusion column shows only the first criterion met by each author.

MISQ = *MIS Quarterly*; ISR = *Information Systems Research*; JMIS = *Journal of Management Information Systems*; ISJ = *Information Systems Journal*; EJIS = *European Journal of Information Systems*.

n/a indicates no publications to cite in this period.

Italicized authors were dropped from the final set.

as input for the factor and MDS analyses, the two analytic techniques used most prevalently in co-citation research (McCain 1990; White and McCain 1998). The database program also extracted co-citation bibliographies for the groups of foundational authors that loaded on each factor, as described in Appendix B. The bibliographies contained all articles that co-cited any pair of the authors in the factor. A total of 3,818 unique articles citing at least two of the top 100 authors within a factor were retrieved across all factors and periods. The articles obtained were coded for research theme, as described in Appendix C.

Appendix B

Factor Analyses

In co-citation research, factor analysis is performed on a matrix of co-citation counts, in which the same list of foundational authors comprises both the column and row headings, and each cell value represents the number of articles that have cited the relevant pair of foundational authors. In co-citation matrices, no meaningful counts can be applied to cells along the diagonal (i.e., the number of times an author is co-cited with him/herself), although factor analyses requires numbers in these cells. Hence we used mean substitution, the most commonly applied method for addressing this problem in co-citation research (White and McCain 1998). Following the convention typically used in co-citation research (McCain 1990), authors with a mean of less than four co-citations within a period were dropped from that period in order to ensure interpretable results. In order to drop as few authors as possible, an iterative process was used in which the author with the lowest mean co-citation was removed from the data matrix until all remaining authors met the threshold, resulting in the retention of 37 authors for the 1986–1990 period; 63 for the 1991–1995 period; 72 for the 1996–2000 period; and 79 for the 2001–2005 period.

The raw co-citation matrices for each period were used as input for principal component factor analyses with varimax rotation, using SPSS. The results of the factor analyses for each of the four 5-year periods are shown in Tables B1 through B4. As is typical in this type of factor analysis, the factors are not mutually exclusive (i.e., the authors do not load exclusively on a single factor), so interpretation of factors is based on those authors with high loadings (McCain 1990). Authors with high loadings on two or more factors are considered to be contributing to two or more subfields within the discipline (White and McCain 1998). Following typical ACA conventions (Culnan 1987; McCain 1990; White and McCain 1998), authors loading with absolute values less than 0.4 on any factor were suppressed. (For the 1996–2000 period the absolute threshold loading was set at 0.38 in order to ensure that all authors in this set loaded on at least one factor.) The number of factors identified for each period was determined primarily from examinations of scree plots and secondarily from a consideration of the number of factors with eigenvalues greater than one. Results yielded a four-factor solution for the first (1986–1990) period, accounting for 74.8 percent of the variance; five-factor solutions for each of the next two periods (1991–1995 and 1996–2000) accounting for 78.7 percent and 73.8 percent of the variance respectively; and a six-factor solution for the final (2001–2005) period, accounting for 76.4 percent of the variance. Our procedures for interpreting the factors and assigning the factor names shown in Tables B1 through B4 are discussed in Appendix C.

Table B1. 1986–1990 Author Factor Loadings (.40 or Higher)

1986-1990 Authors (≥ 4 mean co-citations)	IS Development & Use Thematic Miscellany	IS Strategy	Group Work & Decision Support	Foundations & Reference Disciplines
Swanson	0.901			
Mumford	0.898			
Markus	0.887			
Robey	0.875			
Kling	0.873			
Ginzberg	0.859			
Baroudi	0.832			
Olson	0.812			
Lucas	0.792			
Ives	0.742	0.418		
Zmud	0.651	0.576		
Dickson	0.608		0.412	
Keen	0.537	0.424		
McLean		0.917		
McKenney		0.903		
Nolan		0.873		
McFarlan		0.831		
Wetherbe		0.799		
Rockart	0.414	0.774		
KingWR	0.544	0.716		
Eindor	0.589	0.711		
Davis	0.585	0.698		
Alavi	0.480	0.568		
Hiltz			0.835	
DeSanctis			0.770	
Huber			0.734	
Konsynski			0.713	
Benbasat	0.435		0.685	
Kraemer			0.678	
Chervany			0.541	0.423
KingJL		0.440	0.523	
Sprague			0.474	
Mason				0.813
Gorry				0.770
Ackoff				0.740
Churchman				0.690
Anthony		0.562		0.591
% Variance	28.9	23.2	12.6	10.1

Table B2. 1991–1995 Author Factor Loadings (.40 or Higher)					
1991-1995 Authors (≥ 4 mean co-citations)	IS Development & Use Thematic Miscellany	Qualitative Methods Thematic Miscellany	IS Strategy	Group Work & Decision Support	Foundations & Reference Disciplines
Igbaria	0.898				
Guimaraes	0.857				
Rivard	0.847				
Lucas	0.799	0.452			
Swanson	0.796	0.464			
Alavi	0.793				
Barki	0.792	0.492			
Baroudi	0.771				
Eindor	0.767		0.445		
Vessey	0.765				
Davis	0.752				
Ginzberg	0.747	0.531			
Olson	0.740	0.435			
Zmud	0.735		0.412		
Ives	0.706				
Straub	0.695				
Dickson	0.662			0.475	
Robey	0.661	0.568			
Benbasat	0.646			0.473	
Keen	0.584				
Couger	0.579				
WatsonHJ	0.548		0.453		0.460
Bjornandersen		0.886			
Boland		0.862			
Mumford		0.849			
Lyytinen		0.823			
Orlikowski		0.809			
Hirschheim		0.780			
Kling		0.773			
Markus	0.478	0.686			
Bostrom	0.616	0.627			
Wiseman			0.955		
Vitale			0.931		
Venkatraman			0.925		
McKenney			0.917		
Clemons			0.906		
McFarlan			0.846		
Lederer	0.509		0.769		
Konsynski			0.763	0.459	
Nolan	0.453		0.760		
Grover			0.752		
Goodhue	0.424		0.744		
Rockart	0.470		0.711		

Table B2. 1991–1995 Author Factor Loadings (.40 or Higher) (Continued)

1991-1995 Authors (≥ 4 mean co-citations)	IS Development & Use Thematic Miscellany	Qualitative Methods Thematic Miscellany	IS Strategy	Group Work & Decision Support	Foundations & Reference Disciplines
KingWR	0.633		0.671		
McLean	0.625		0.656		
Wetherbe	0.595		0.606		
Hiltz				0.940	
WatsonRT				0.906	
Valacich				0.887	
Dennis				0.866	
Vogel				0.856	
Nunamaker				0.844	
Kraemer				0.813	
DeSanctis				0.808	
Huber				0.794	
KingJL				0.665	
Jarvenpaa	0.489			0.628	
Gorry	0.454				0.719
Ackoff					0.707
Mason				0.422	0.695
Churchman		0.477			0.669
Sprague				0.412	0.600
Checkland		0.484			0.531
% Variance	25.9	13.7	18.5	14.5	6.1

Table B3. 1996–2000 Author Factor Loadings (.38 or Higher)

1996-2000 Authors (≥ 4 mean co-citations)	IS Development & Use Thematic Miscellany	Qualitative Methods Thematic Miscellany	IS Strategy	Group Work & Decision Support	Inter-Business Systems
Barki	0.917				
Igbaria	0.882				
Rivard	0.873				
Guimaraes	0.853				
Higgins	0.823				
Baroudi	0.807				
Lucas	0.803	0.383			
Ginzberg	0.802				
Eindor	0.800		0.427		
WatsonHJ	0.799				
Olson	0.792				
Straub	0.783				
Wetherbe	0.757		0.456		
Galletta	0.746				
Ives	0.740				

Table B3. 1996–2000 Author Factor Loadings (.38 or Higher) (Continued)

1996-2000 Authors (≥ 4 mean co-citations)	IS Development & Use Thematic Miscellany	Qualitative Methods Thematic Miscellany	IS Strategy	Group Work & Decision Support	Inter-Business Systems
Swanson	0.727	0.490			
Zmud	0.681		0.456		
Goodhue	0.678		0.407		
Davis	0.674		0.390		
Robey	0.658	0.584			
Couger	0.637				
Todd	0.630			0.437	
Vessey	0.610			0.460	
Sprague	0.454			0.426	
Boland		0.867			
Lyytinen		0.849			
Lee		0.846			
Walsham		0.831			
Kling		0.829			
Hirschheim		0.803			
Checkland		0.767			
Mumford	0.415	0.758			
Orlikowski		0.742			
Land		0.702	0.397		
Markus	0.403	0.695			
Wiseman			0.895		
McKenney			0.856		
Nolan			0.848		
McFarlan			0.816		
Venkatraman			0.796		
Galliers		0.495	0.725		
Rockart	0.476		0.717		
Clemons			0.714		0.533
KingWR	0.570		0.700		
Lederer	0.564		0.695		
Grover	0.470		0.639		
Lacity		0.412	0.605		
Kettinger			0.588		
Willcocks		0.511	0.585		
Konsynski			0.577		0.498
Keen	0.522	0.427	0.546		
KingJL			0.382		
WatsonRT				0.925	
Huber				0.910	
Hiltz				0.904	
DeSanctis				0.891	
Vogel				0.877	

Table B3. 1996–2000 Author Factor Loadings (.38 or Higher) (Continued)

1996-2000 Authors (≥ 4 mean co-citations)	IS Development & Use Thematic Miscellany	Qualitative Methods Thematic Miscellany	IS Strategy	Group Work & Decision Support	Inter-Business Systems
Valacich				0.852	
Nunamaker				0.852	
Dennis				0.849	
Dickson				0.813	
Jarvenpaa				0.804	
Sambamurthy			0.423	0.804	
Kraemer				0.746	
Benbasat				0.685	
Bostrom	0.591			0.648	
Alavi	0.611			0.635	
Mason				0.548	
Kriebel					0.794
Barua					0.789
Mukhopadhyay					0.784
Whinston				0.414	0.675
% Variance	24.1	13.4	14.9	16.4	5.0

Table B4. 2001–2005 Author Factor Loadings (.40 or Higher)

2001-2005 Authors (≥ 4 mean co-citations)	IS Development & Use Thematic Miscellany	Internet Application s Thematic Miscellany	Qualitative Methods Thematic Miscellany	IS Strategy	Group Work & Decision Support	Inter- Business Systems
Ginzberg	0.782					
Baroudi	0.775					
Olson	0.766					
Guimaraes	0.733	0.420				
Ives	0.677					
Eindor	0.635			0.618		
WatsonHJ	0.532	0.486				
Agarwal		0.910				
Higgins		0.909				
Chin		0.884				
Chervany		0.883				
Igbaria		0.842				
Tam		0.839				
Todd		0.823				
Cavaye		0.816				
Straub		0.808				
Lucas	0.498	0.687				
Goodhue		0.655		0.526		

Table B4. 2001–2005 Author Factor Loadings (.40 or Higher) (Continued)

2001-2005 Authors (≥ 4 mean co-citations)	IS Development & Use Thematic Miscellany	Internet Application s Thematic Miscellany	Qualitative Methods Thematic Miscellany	IS Strategy	Group Work & Decision Support	Inter- Business Systems
Barki	0.580	0.645				
Davis		0.604	0.402			
Vessey		0.497			0.425	
Walsham			0.914			
Baskerville			0.912			
Kling			0.863			
Lee			0.856			
Mumford			0.851			
Lyytinen			0.842			
Checkland			0.804			
Hirschheim			0.750			
Markus			0.722			
Robey			0.711			
Orlikowski			0.699			
WeberR			0.616			
Swanson	0.496		0.579			
KingJL			0.453			
Vitale				0.846		
Ward				0.805		
McFarlan				0.800		
McKenney				0.799		
Venkatraman				0.796		
Rockart				0.787		
Lederer				0.774		
KingWR	0.465			0.735		
Galliers			0.564	0.686		
Kettinger	0.432			0.678		
Clemons				0.673		0.620
Grover		0.409		0.664		
Keen				0.660		
Sambamurthy		0.529		0.630		
Wetherbe	0.530	0.418		0.606		
McLean				0.597		
Willcocks			0.440	0.589		
Saunders				0.576		
Rivard	0.403	0.530		0.545		
Lacity				0.538		
Zmud		0.481		0.506		
Benbasat		0.475		0.441		
Hiltz					0.930	
Vogel					0.887	

Table B4. 2001–2005 Author Factor Loadings (.40 or Higher) (Continued)

2001-2005 Authors (≥ 4 mean co-citations)	IS Development & Use Thematic Miscellany	Internet Applications Thematic Miscellany	Qualitative Methods Thematic Miscellany	IS Strategy	Group Work & Decision Support	Inter-Business Systems
Valacich					0.885	
Dennis					0.861	
Nunamaker					0.853	
DeSanctis					0.841	
Dickson					0.826	
Bostrom					0.723	
Wei					0.719	
Huber				0.428	0.701	
Alavi					0.584	
WatsonRT					0.582	
Leidner					0.568	
Jarvenpaa		0.459			0.541	
Kriebel						0.851
Kauffman						0.839
Barua						0.808
Mukhopadhyay						0.801
Whinston						0.674
Konsynski		0.443		0.460		0.658
Zwass					0.413	0.488
Kraemer				0.472		0.488
% Variance	9.4	16.5	13.6	16.9	12.6	7.4

Appendix C

Derivation of Factor Names from Research Themes

Factor names were derived by coding the sets of articles co-citing authors within each factor and identifying predominant research themes. We based our initial coding on the classification scheme developed by Swanson and Ramiller (1993) and shown in Table C1. We began our coding by having each author code a sub-set of the co-citing articles in the 1986–1990 period independently. On discussing our codings for this sub-set, we noted that some of the distinctions made by Swanson and Ramiller were difficult to apply consistently. Consequently, as recommended by Miles and Huberman (1994), we developed and redefined the categories to better fit our data, adding more detailed descriptions of each category and heuristics to guide our application of the codes. For articles where none of the existing categories seemed to fit, we used a close reading of the title and abstract to identify newly emergent research themes, which were discussed and agreed by all three authors before being implemented in subsequent coding (Ryan and Bernard 2000). For example, Swanson and Ramiller had no category for the group decision support systems theme, and it was apparent from our initial coding tests of the very first period that this was a distinctive and important category. Other codes, for example *knowledge management* and *internet & internet users*, emerged later in the second and third periods, respectively. When these new codes were added, we reviewed our coding in the previous periods. In each case, we agreed on only a small number of changes to the earlier coding. Within each major category, we developed sub-codes to enable us to apply a fine-grained level of coding initially. While we aggregated these low-level codes to their higher-level categories for subsequent analysis, the detailed sub-codes were invaluable in assisting further *post hoc* analyses. Our final coding scheme, shown in Table C1, comprised 14 themes, in contrast to the 9 themes used in the Swanson and Ramiller framework.

Table C1. Coding Scheme for Research Themes Developed from Swanson and Ramiller (1993)

Research Theme Used in the Current Study	Swanson & Ramiller's Original Theme	Description
Computer supported cooperative work (CSCW) and teams	CSCW	CSCW, supporting work and people, including telecommuting and teleworking; teams, including team interactions and managing teams (focus on people)
Human–computer interaction (HCI) and interface design	Information and interface	Human and design aspects of HCI; user interface design
Decision support systems (DSS)	Decision support and knowledge-based systems	Information and managerial decision making (the human side of decision making); DSS design, models, development, implementation, outcome and applications; Expert systems design, models, development, implementation, outcome and applications
Group decision support systems (GDSS)		GDSS design, models, development, implementation, outcome and applications, including negotiation systems and collaboration systems (focus on systems)
Information system development (ISD)	Systems projects	Systems development process, methodologies, analysis, design, tools and techniques; project management; user involvement in ISD; data modeling and data design; software maintenance
Information system management, evaluation, and control	Evaluation and control	Measures of performance and success of systems (but not costs/benefits); data management; computer resource allocation; IS security and control; IS ethics; IS personnel and IS management
IS users	Users	IS-user relationships; user perceptions and attitudes; user information evaluation and satisfaction; end-user computing; user training, user technology acceptance
IS strategy and business outcomes	Economics and strategy	IS strategic management and business outcomes related to strategy; globalization; outsourcing; IS in developing countries; IS and culture
Interorganizational systems and e-business		Interorganizational systems; electronic data interchange (EDI); supply chain management (SCM); e-business application projects
IS introduction, diffusion and impact	Introduction and impact	IS implementation; information technology diffusion; organizational impact of IT introduction
IS research, theory and education	IS research	IS typologies; IS research; IS theory; IS history; IS learning and education
Knowledge management		Knowledge acquisition; knowledge management; learning organizations
Internet and internet users		General internet and e-commerce theories and models; internet applications and evaluation; internet users; mobile commerce; computer-mediated communication; user technology acceptance in internet applications
Foundations and other disciplines		Research primarily focused in other disciplines, particularly management science, operations research, and computer science

The first, second, and third authors independently coded all factors in the 1986–1990 period and the first and third authors coded two factors in the 2001–2005 period. The third author coded all remaining factors, with the first author cross checking a random 10 percent of the articles. All recoding was checked and agreed to by the first and third authors. Agreement between coders before discussion was 90 percent across all articles coded.

Research Themes Within Factors

The research themes of the sets of articles co-citing authors in each factor within each period are shown in Table C2, with the major themes for each factor highlighted. The counts and percentages of themes for each factor were calculated as follows: We made the assumption that the research themes of articles co-citing a greater number of authors in a given factor would be more likely to align with the central theme of the factor than the themes of articles that cited fewer of the factor's authors. Hence in determining the contribution of an article to the overall research theme of the factor, we weighted each article by the number of factor authors the article cited. For example, an article by Doll and Torkzadeh (1989) cites 11 authors from one factor and 3 authors from a second factor in the 1986–1990 period, and was coded to the “IS users” research theme. This article was given a weight of 11 in the count of the “IS users” theme in the first factor for period 1986–1990, but a weight of only 3 in the count of that theme in the second factor. This weighting approach helped to differentiate between the themes, particularly for those factors with a high number of cross-loading authors.

Table C2. Number and Percentage of Weighted Co-Citing Articles Coded to Each Research Theme in Each Factor for Each Period (Each article weighted by the number of authors cited from the factor; predominant research themes in bold.)

Research Theme	IS Development & Use Thematic Miscellany	Qualitative Methods Thematic Miscellany	Internet Applications Thematic Miscellany	IS Strategy	GDSS	Inter- Business Systems	Foundations & Reference Disciplines
1986–1990							
CSCW and teams	11 (1%)			4 (1%)	19 (7%)		0 (0%)
HCI and interface design	30 (3%)			4 (1%)	17 (6%)		2 (1%)
DSS	112 (10%)			61 (9%)	65 (23%)		29 (20%)
GDSS	8 (1%)			6 (1%)	79 (27%)		4 (3%)
IS development	204 (20%)			127 (19%)	8 (3%)		27 (19%)
IS management, evaluation and control	106 (10%)			99 (15%)	15 (5%)		0 (0%)
IS users	220 (21%)			116 (17%)	27 (9%)		4 (3%)
IS strategy and business outcomes	93 (9%)			97 (15%)	10 (3%)		11 (8%)
Interorganizational systems and e-business	17 (2%)			32 (4%)	4 (1%)		0 (0%)
IS introduction, diffusion, and impact	134 (13%)			64 (9%)	20 (7%)		2 (1%)
IS research, theory, and education	84 (8%)			56 (8%)	15 (5%)		25 (18%)
Knowledge management	2 (0%)			2 (0%)	5 (2%)		0%
Internet and Internet users	0 (0%)			0 (0%)	0 (0%)		0 (0%)
Foundations and other disciplines	16 (2%)			7 (1%)	6 (2%)		38 (27%)
1991–1995							
CSCW and teams	19 (1%)	22 (2%)		4 (0%)	127 (11%)		2 (1%)
HCI and interface design	80 (3%)	11 (1%)		3 (0%)	56 (5%)		2 (1%)
DSS	436 (15%)	67 (7%)		94 (8%)	221 (20%)		77 (27%)
GDSS	43 (2%)	34 (3%)		15 (1%)	351 (30%)		12 (4%)
IS development	445 (16%)	234 (24%)		101 (9%)	58 (5%)		41 (14%)
IS management, evaluation, and control	303 (11%)	82 (8%)		122 (10%)	49 (4%)		8 (3%)
IS users	398 (14%)	133 (14%)		90 (8%)	37 (3%)		7 (2%)
IS strategy and business outcomes	340 (12%)	52 (5%)		334 (29%)	59 (4%)		13 (4%)
Interorganizational systems and e-business	76 (2%)	9 (1%)		113 (9%)	14 (2%)		2 (1%)
IS introduction, diffusion, and impact	304 (11%)	187 (19%)		148 (13%)	68 (6%)		8 (3%)

Table C2. Number and Percentage of Weighted Co-Citing Articles Coded to Each Research Theme in Each Factor for Each Period (Continued)

Research Theme	IS Development & Use Thematic Miscellany	Qualitative Methods Thematic Miscellany	Internet Applications Thematic Miscellany	IS Strategy	GDSS	Inter-Business Systems	Foundations & Reference Disciplines
IS research, theory, and education	212 (7%)	59 (6%)		62 (5%)	75 (6%)		38 (13%)
Knowledge management	14 (1%)	4 (0%)		6 (1%)	20 (2%)		4 (1%)
Internet and Internet users	0 (0%)	0 (0%)		0 (0%)	0 (0%)		0 (0%)
Foundations & other disciplines	170 (6%)	94 (10%)		81 (7%)	18 (2%)		73 (26%)
1996–2000							
CSCW and teams	97 (3%)	45 (3%)		19 (1%)	219 (12%)	5 (2%)	
HCI and interface design	29 (1%)	6 (0%)		7 (0%)	111 (6%)	0 (0%)	
DSS	295 (9%)	47 (3%)		87 (5%)	238 (13%)	29 (10%)	
GDSS	48 (1%)	16 (1%)		16 (1%)	525 (29%)	4 (2%)	
IS development	446 (13%)	228 (16%)		140 (7%)	97 (5%)	10 (4%)	
IS management, evaluation, and control	356 (11%)	158 (11%)		192 (10%)	84 (4%)	9 (3%)	
IS users	544 (16%)	66 (4%)		135 (7%)	117 (6%)	3 (1%)	
IS strategy and business outcomes	419 (12%)	220 (15%)		535 (29%)	65 (3%)	20 (7%)	
Interorganizational systems and e-business	191 (6%)	130 (9%)		269 (14%)	38 (2%)	126 (45%)	
IS introduction, diffusion, and impact	641 (19%)	302 (21%)		382 (20%)	121 (7%)	51 (19%)	
IS research, theory, and education	169 (5%)	115 (8%)		76 (4%)	105 (6%)	10 (4%)	
Knowledge management	42 (1%)	19 (1%)		23 (1%)	22 (1%)	0 (0%)	
Internet and Internet users	95 (3%)	89 (6%)		13 (1%)	81 (5%)	2 (1%)	
Foundations and other disciplines	18 (1%)	24 (2%)		2 (0%)	13 (1%)	4 (2%)	
2001–2005							
CSCW and teams	20 (2%)	58 (4%)	111 (4%)	55 (2%)	195 (15%)	2 (0%)	
HCI and interface design	4 (0%)	5 (0%)	26 (1%)	2 (0%)	15 (1%)	0 (0%)	
DSS	59 (6%)	36 (2%)	130 (4%)	86 (3%)	54 (4%)	12 (2%)	
GDSS	6 (1%)	27 (2%)	54 (2%)	55 (2%)	267 (21%)	13 (2%)	
IS development	121 (13%)	241 (16%)	241 (8%)	158 (6%)	111 (9%)	4 (1%)	
IS management, evaluation, and control	128 (14%)	103 (7%)	207 (7%)	184 (7%)	23 (2%)	6 (1%)	
IS users	142 (15%)	67 (5%)	456 (15%)	133 (5%)	68 (5%)	2 (0%)	
IS strategy and business outcomes	158 (16%)	215 (14%)	378 (12%)	778 (30%)	62 (5%)	40 (8%)	
Interorganizational systems	48 (5%)	96 (7%)	385 (13%)	491 (18%)	57 (4%)	301 (55%)	
IS introduction, diffusion, and impact	126 (14%)	272 (19%)	319 (11%)	331 (12%)	56 (4%)	44 (8%)	
IS research, theory, and education	42 (5%)	195 (13%)	137 (5%)	101 (4%)	69 (5%)	11 (2%)	
Knowledge management	23 (2%)	69 (5%)	111 (4%)	115 (4%)	211 (16%)	18 (3%)	
Internet and Internet users	54 (6%)	57 (4%)	429 (14%)	163 (6%)	109 (9%)	85 (15%)	
Foundations and other disciplines	12 (1%)	21 (2%)	13 (0%)	16 (1%)	7 (1%)	7 (1%)	

Analyses of Research Themes of Sets of Co-Citing Articles

The predominant themes—that is, generally those two or three themes that accounted for at least 50 percent of the co-citing articles within a factor—were used to make an initial determination of the primary focus of the factor. All three authors reviewed the research themes for each factor and discussed and agreed on names for the factors that we believed best captured the essence of the major themes in the factor. As the characteristics of each factor began to crystallize, we considered the research areas of the leading foundational authors in each factor, recognizing that, over time, many of these foundational authors have worked, and have been cited, in multiple areas. We also reviewed the editorial policies of the journals publishing the co-citing articles to ensure that the naming made sense. (Details about the journals publishing co-citing articles in each factor are presented in Appendix D.)

This approach worked well for the *IS Strategy, Group Work & Decision Support (GDSS), Foundations & Reference Disciplines*, and *Inter-Business Systems* factors, but the remaining three factors all included a similar distribution of research themes and required further analysis of methodological and contextual characteristics of the co-citing articles to establish the nature of the common influence of the foundational authors.

The factor finally called *IS Development & Use Thematic Miscellany* was the most difficult to name. For the first three periods it accounted for the most variance and clearly held a central position in the field, but its set of research themes were relatively diverse. Thus we reviewed the co-citing articles and the author membership of the factor closely, before concluding that this factor has formed around key authority figures in the field and encompasses a broad set of system- and relationship-oriented research into information systems—their development, their implementation, their impact, and their use by individuals and within organizations.

While the research themes of the *Internet Applications Thematic Miscellany* factor also included similar development, implementation, impact, and use issues, there was a clear emphasis in the set of co-citing articles on the Internet as the context of inquiry. The *Qualitative Methods Thematic Miscellany* factor, however, was more difficult, with its major theme, related to research methodology, confirmed only after a consideration of the journal outlets and the author membership and factor time lines (discussed in Appendices D and E, respectively).

Appendix D

Journal Outlets for Each Factor and Across the Field

The top 10 journals publishing articles citing authors in each factor during the most recent 10 years of the factor's coverage are shown in Table D1. For all factors except *Foundations & Reference Disciplines*, we focused on the most recent 10 years (1996–2005), because the *Journal of Management Information Systems*, one of the more important IS journals (Saunders 2006), is only indexed by Web of Science from 1996 onward and hence is under-represented in counts of journals in the earlier two time periods. Since the *Foundations & Reference Disciplines* factor only appears in the first two time periods, we report the publishing journals from 1986–1995 for this factor. For all factors except the *Foundations & Reference Disciplines* factor, *Information & Management, MIS Quarterly*, and *Journal of Management Information Systems* dominate the rankings, but differences in the other journals appearing in the top 10 for each factor help to distinguish between factors. For example, *Information Systems Journal*, ranked the third highest publishing outlet for the *Qualitative Methods Thematic Miscellany* factor, gives strong support to qualitative research in its editorial policies, helping to confirm our choice of name for this factor. Similarly, the journal outlets for the *GDSS* factor include *Decision Support Systems* in third place, while the *Foundations & Reference Disciplines* factor shows a heavy emphasis on operations research journals.

We also combined all of the co-citing bibliographies and removed duplicates (since articles co-citing cross-loading authors were included in the bibliographies for both cross-loaded factors) to gain a picture of the overall publication patterns for the field. A total of 3,818 unique articles were published across 179 different journals. Sixty of these journals each published at least 10 articles, while the top 20 journals, shown in Table D2, contained 72 percent of the articles. Not surprisingly, seven of the eight journals in the AIS senior scholars' expanded basket of journals (*MIS Quarterly, Information Systems Research, Journal of Management Information Systems, Information Systems Journal, European Journal of Information Systems, Journal of Information Technology*, and *Journal of Strategic Information Systems*) feature in the top 20 journals in Table D2, but the leading ranking of *Information & Management* both overall, and in the individual factor rankings, may be more surprising.

Table D1. Top Ten Journals Publishing Articles Citing Authors in Each Factor (for Periods 1996–2005 for All Factors Except Foundations; Foundations for Periods 1986–1995)

Rank	IS Strategy	IS Development & Use Thematic Miscellany	Internet Applications Thematic Miscellany	Qualitative Methods Thematic Miscellany	GDSS	Inter-Business Systems	Foundations and Reference Disciplines (1986–1995)
1	I&M	I&M	I&M	I&M	I&M	JMIS	JORS
2	MISQ	MISQ	JMIS	MISQ	MISQ	I&M	MISQ
						ISR	Systems Research [†]
3	JIT	EJIS	JCIS	ISJ	DSS		
			MISQ				
4	EJIS	JCIS		JIT	JMIS	DSS	Omega
5	JMIS	JIT	ISR	EJIS	ISR	MISQ	EJOR
6	IJIM	IJIM	EJIS	JSIS	JCIS	IJEC	Interfaces
	JSIS	ISR	JSIS				
7				JMIS	IJHCS	JIT	I&M
						MS	
8	ISR	JSIS	ISJ	IJIM	EJOR		DSS
9	JCIS	ISJ	IJIM	ISR	EJIS	JOCEC	IEEE Transactions
10	ISJ	JMIS	DSS	Information Society	MS	JCIS	

[†]The journal *Systems Research* was a publishing outlet for some researchers co-citing the authors in the “Foundations” factor. The journal merged with *Behavioral Science* in 1997 and continues as *Systems Research & Behavioral Science*.

Notes: DSS = *Decision Support Systems*; EJIS = *European Journal of Information Systems*; EJOR = *European Journal of Operational Research*; IEEE Transactions = *IEEE Transactions on Systems, Man and Cybernetics Management Science*; IJEC = *International Journal of Electronic Commerce*; IJHCS = *International Journal of Human-Computer Studies*; IJIM = *International Journal of Information Management*; I&M = *Information & Management*; ISJ = *Information Systems Journal*; ISR = *Information Systems Research*; JCIS = *Journal of Computer Information Systems*; JIT = *Journal of Information Technology*; JMIS = *Journal of Management Information Systems*; JORS = *Journal of the Operational Research Society*; JOCEC = *Journal of Organizational Computing and Electronic Commerce*; JSIS = *Journal of Strategic Information Systems*; MISQ = *MIS Quarterly*; MS = *Management Science*; Omega = *Omega–International Journal of Management Science*

Table D2. Top 20 Journals Publishing IS Research During the Period 1986–2005

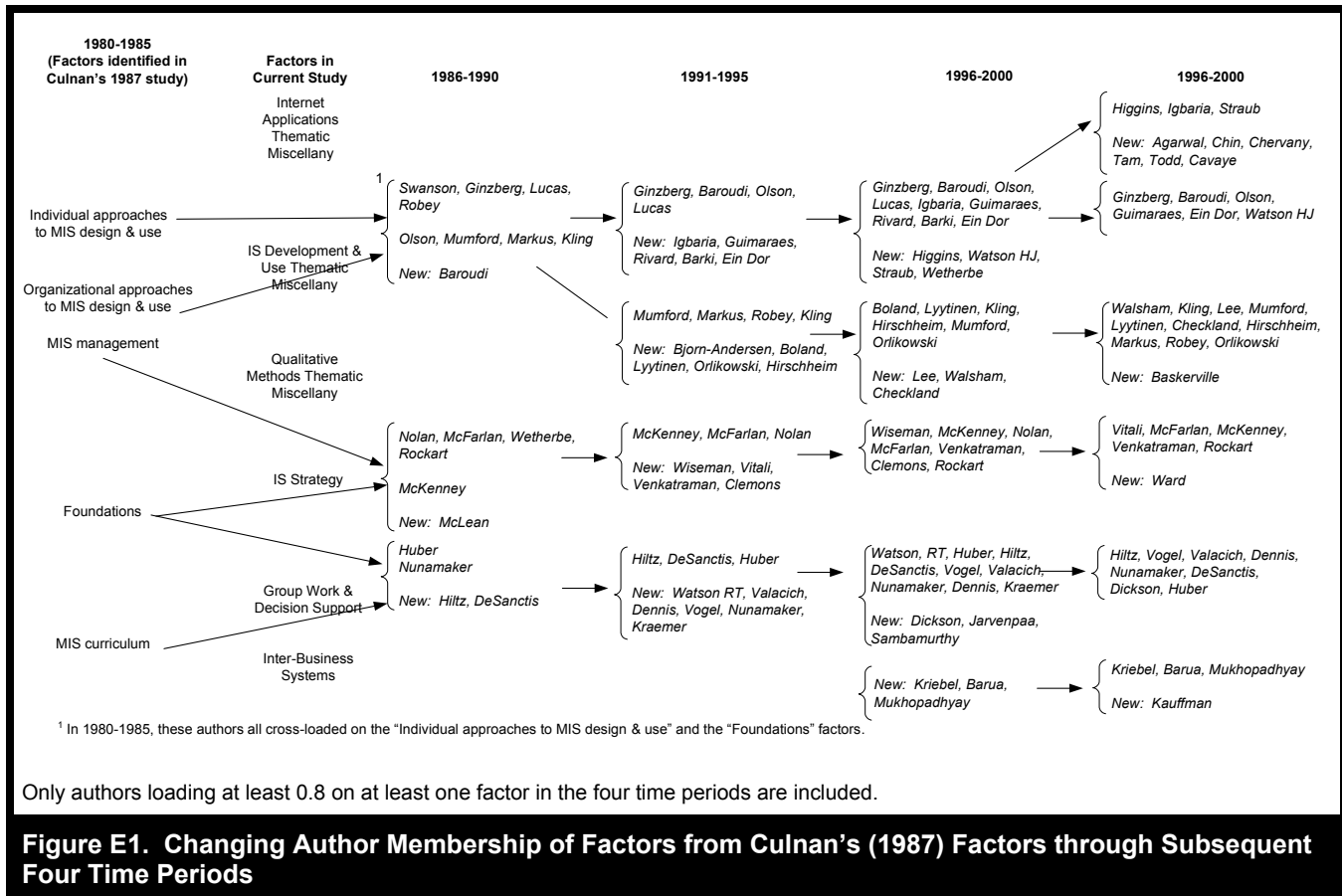
Journal	Number of Articles Out of 3,818 Total	Percent
Information & Management	444	12%
MIS Quarterly	348	9%
Journal of Computer Information Systems	167	4%
International Journal of Information Management	161	4%
Journal of Information Technology	155	4%
Information Systems Research	155	4%
Decision Support Systems	146	4%
European Journal of Information Systems	133	3%
Journal of Management Information Systems	133	3%
Omega-International Journal of Management Science	132	3%
Information Systems Journal	124	3%
Journal of Strategic Information Systems	109	3%
Behaviour & Information Technology	97	3%
Management Science	84	2%
European Journal of Operational Research	79	2%
Communications of the ACM	64	2%
International Journal of Human-Computer Studies	64	2%
Journal of the Operational Research Society	54	1%
Industrial Management & Data Systems	49	1%
International Journal of Electronic Commerce	40	1%

Appendix E

Key Foundational Authors Associated with Factors over Time

To help confirm our factor interpretations, we created timelines of the author composition of each factor. We traced the movement of high loading authors (those loading at least 0.8 on at least one factor in one of the four periods), starting from Culnan's (1987) factors, and tracked how factor membership changed through the following periods. Figure E1 shows the detailed movement of high loading authors, while a summary timeline showing how each factor has evolved through the periods is shown in Figure 8 in the body of the article. As shown in Figure E1, authors from four of Culnan's five factors split and recombine in subsequent periods. Culnan's fifth factor, MIS curriculum, which comprised only three authors, has no corresponding factor in any subsequent period.

The time lines revealed that the authors in the 1986–1990 *IS Development & Use Thematic Miscellany* factor split into two factors in subsequent periods, and yet the research themes for both factors seemed very similar. A consideration of the author membership of the “breakaway” factor led us to speculate that these authors were being cited by researchers with an interest in the use of qualitative methods to examine key research topics in the IS field. In order to further confirm our understanding, we undertook a secondary coding of the articles co-citing authors in the parent *IS Development & Use Thematic Miscellany* factor and the offspring factor, categorizing articles according to whether they reported quantitative or qualitative methods. We also examined the journal outlets for the offspring factor, as discussed previously in Appendix D, before agreeing on the final name of *Qualitative Methods Thematic Miscellany*.



Appendix F

Technical Limitations

Although this study avoids the problems associated with the limited selection of journals for analysis seen in earlier citation studies (Grover et al. 2006; Wade et al. 2006), there are other limitations arising from the author co-citation research approach used. In particular, the final choice of influential authors and the analysis of researcher perspectives of these authors' key research areas through co-citation counts rely on an initial citation analysis. In this respect it is interesting to note differences between our author set and the one developed by Lowry et al. (2007), and to note once again the impact of basket of journal choices. Lowry et al. limited their study to authors published in *MIS Quarterly*, *Information Systems Research*, and the IS articles from *Management Science* and focused solely on citations, not on publication counts. In our study, we cast a much broader net across the wide range of constituencies that comprise the IS field, in order to identify a body of contributors whose whole corpus of work has been influential over time, either through a high number of publications in premier IS journals, or by outstanding contributions through books or service to the field. Thus, we drew our publication counts from a wider set of journals (*MIS Quarterly*, *Information Systems Research*, *Journal of Management Information Systems*, *European Journal of Information Systems*, and *Information Systems Journal*) and established a high bar of number of publications for inclusion in the author set. As a result, only 45 of the authors reported on in Lowry et al. are included among our final authors drawn from publication counts. In addition, our set includes 45 authors selected on a reputational basis, of which only 4 appear in Lowry's list. However, these reputational authors have had significant impact on the field, as evidenced by citations to their work.

We also note differences in the citation counts for authors appearing on both the Lowry et al. list and our list, and that the total number of citations to our key authors is lower than might be expected from other recent studies such as Grover et al. (2006) and Wade et al. (2006).

These differences result from our decision to limit citing references to information systems categories, in order to focus on author influence *within* the IS field, rather than beyond it. The Grover et al. and Wade et al. studies were aimed at examining the IS field's position within a larger body of disciplines to determine the extent to which IS makes a contribution beyond the IS field, while Lowry et al. used citation analysis to determine the impact of IS institutions, articles, and authors, both within and beyond the IS field. In contrast, our goal was to identify those authors who have had seminal impact *within* the IS field and hence might be expected to have provided leadership on the direction of the field. A number of our leading authors are highly published in non-IS journals and if we had included all citations to their work we would get a very different picture of the most influential authors—however, they would no longer necessarily be the most influential *within* the field.

An examination of the lower ranked authors in Table A1 in Appendix A reveals that 21 have no publications available to cite in the first 5-year period. The impact of these researchers on the IS field may well be seen more substantially in future years. Some of the other low-cited authors are surprising, however, and highlight other limitations of using co-citation analysis as a tool for examining influence in a field. For example, Langefors has been recognized with a Leo Award for his contributions to IS research and practice, particularly in Scandinavia, and Neumann, an AIS Fellow, has been recognized for his impact on IS teaching, practice, and research in Israel. Both of these authors are under-recognized by our approach and illustrate two biases set by our research design. First, our focus on English-language articles disadvantages researchers whose influence has been primarily in non-English speaking countries. Second, the citation analysis approach under-recognizes those whose contribution has been primarily in teaching and service areas. Another limitation is that second or subsequent authors of books do not get citation credits under the SSCI citation indexing system, and this is reflected in Carlson's low citation count. Carlson was a second author with Sprague on a key book, *Building Effective Decision Support Systems*, and it is worth noting that 166 of the 311 citations recorded for Carlson's co-author, Sprague, are citations to their co-authored book. Finally, Jackson has been highly cited in the Web of Science Science Citation Index Expanded database and his low ranking here reflects our deliberate exclusion of citations in more technical computer science areas in order to keep our focus as tightly as possible on the IS field.

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